BARBADOS.

IMPERIAL MYCOLOGICAL INSTITUTE
31 AUG 1945

ANNUAL REPORT

OF THE

Department of Science and Agriculture

FOR THE YEAR

Ending 31st March, 1944.

Printed by the Advocate Co., Ltd.
Printers to the Government of Barbados.

REPORT ON THE WORK OF THE DEPARTMENT OF SCIENCE AND AGRICULTURE

For the Year Ending the 31st March, 1944.

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STAFF:

Dr. S. J. Saint, O.B.E., Director of Agriculture, was granted duty leave from the 14th of April, 1943, to the 11th of May, 1943, to attend a Supply Officers' Conference in New York. He also paid a visit to Canada. Dr. A. E. S. McIntosh, Deputy Director of Agriculture, acted as Director of Agriculture.

Dr. A. E. S. McIntosh was absent from the Colony on duty leave from the 30th of December, 1943, to the 14th of February, 1944. Accompanied by Mr. B. deL. Inniss, Assistant Botanist of the B.W.I. Central Sugar Cane Breeding Station, he proceeded to Trinidad and to Jamaica on work in connection with the British West Indies Central Sugar Cane Breeding Station.

Mr. R. W. E. Tucker, M.A., B.Ed., Entomologist, was granted five months and twenty-six days' vacation leave from the 28th of November, 1943, to proceed to Canada.

Mr. F. H. B. Blackburn, B.Sc., a Colonial Agricultural Scholar in Agricultural Chemistry at the Imperial College of Tropical Agriculture, was appointed Chemist of this Department as from the 20th of August, 1943, in succession to Mr. C. B. Johnston who died on active service in 1942.

Mr. F. A. Sweet, B.Sc., Lecturer in Natural Sciences, was granted two months' sick leave from the 30th of July to proceed to North America.

Mr. J. A. Allan, B.Sc., Lecturer in Botany, Chemistry and Physics, resigned his appointment with effect from the 31st of October, 1943.

Mr. G. A. Southwell, D.I.C.T.A., Acting Agricultural Assistant, B.W.I. Central Sugar Cane Breeding Station, was appointed to act for him.

Mr. N. Carmichael, Analytical Assistant, who had been undertaking part-time instruction in Chemistry at Harrison College, resigned his post on the 15th of September, 1943, to take up an appointment as Science Master at Kingston College, Jamaica. Mr.K. H. C. Thorne, Sub-Inspector of Plant Diseases was selected to fill the vacancy.

Mr. G. T. Cummins tendered his resignation as Third Sugar Analyst with effect from the 1st of September, 1943, and proceeded to McGill University, Montreal, with the object of taking a full medical course. He was succeeded by Mr. E. M. Maxwell.

Mr. T. O. Phillips, Senior Peasants' Agricultural Instructor, resigned his post as from the 1st of October, 1943, on his appointment to the post of Assistant Social Welfare Officer, and Mr. A. D. Herbert, D.I.C.T.A. Agricultural Assistant, B.W.I. Central Sugar Cane Breeding Station, was appointed on the 1st February, 1944, to succeed him.

The following were appointed as from the 1st of March, 1944, to the nine newly created posts of Peasants' Agricultural Instructors: Messrs. L. T. Talma, C. D. Spooner, G. A. Ramsay, C. B. Cummins, E. S. Brathwaite, F. Cummins, V. F. Gay, A. Yard and E. G. St. John.

1. WEATHER AND CROP PRODUCTION.

Rainfall throughout the year totalled 57.39 inches; which is 4 inches above the total rainfall for the previous year. The average rainfall for September to December, 1943, was better than in 1942, and the peak rainfall came in October, 1943.

2. Distribution of rain for the island as a whole was irregular at certain periods of the season, and this, coupled with the lack of fertilisers particularly sulphate of ammonia and with late applications resulted in the crop dropping from a first estimate of 133,000 tons to 105,000 tons, despite the facts that nearly 74% of the cane acreage was under new and high yielding varieties and factories obtained good sugar recoveries.

3. The acreage under plantation cane was approximately 750 acres less than in 1942, due to increased acreage in food crops. The influence of contour drainage in cane crop production appears favourable from results obtained during the year under review.

4. The carry over of fancy molasses was completely disposed of in 1943 and, as a result, the manufacture of molasses was resumed during the 1944 reaping period. The Fancy Molasses Control and Marketing Board allocated some 61,000 puncheons (about 20,330 tons), for production at various factories, and it is expected that the improved shipping situation will enable this amount to be moved in 1944.

5. Yields of ground provisions and of cotton were not up to expectation for various reasons, including irregular rainfalls and lack of insecticides for keeping insect pests under control.

2. SUGAR.

6. The 1943 sugar crop amounted to the equivalent of 133,273 tons of sugar made up as follows:—

Vacuum Pan Factories	132,031	tons
Muscovado	1,242	„
Fancy Molasses	—	„
	133,273	„

7. The crop to be reaped in 1944 is estimated at 104,497 tons.

8. The position with regard to local consumption of sugar and exports of sugar and fancy molasses during the quota year 1942—1943 may be summarised as follows:—

		Tons
Estimated stocks in hand for export at 1st September, 1942:		
Fancy Molasses	18,379 tons	
Sugar	41,270 „	59,649
Production: Crop 1943.		133,273
		192,922

Estimated stocks in hand for export at 1st September, 1943:		
Fancy Molasses	9,699 tons	
Sugar	69,282 „	78,981
		113,941
Total exports for quota year 1942/43 as per Customs returns:		
Fancy Molasses	8,907 tons	
Sugar	91,555 „	100,462
Difference representing sugar left in the Island for local consumption		13,479

9. As a result of the large 'carry over' of molasses (from the 1942 crop) due to shipping difficulties, no molasses was manufactured during 1943. By the end of December, 1943 most of this 'old crop' molasses had been shipped, and the Fancy Molasses Control & Marketing Board allocated some 61,000 puncheons of Fancy Molasses for production for export during 1944 crop year. Of this quantity about 36,000 puncheons of syrup were allocated to small fancy molasses factories while the remaining puncheons were allocated to larger vacuum pan factories.

10. It is considered that in view of the improved shipping conditions most of this molasses will be exported during 1944.

11. The returns received from plantations under the Sugar Cane Census Act for the 1944 crop show that there were 29,796 acres under cane made up of 14,144 acres of plant canes, 10,557 acres of first ratoons, 4,203 acres of second ratoons, 815 acres of third ratoons and 77 acres of sixth ratoons. In addition, the acreage of cane estimated to have been reaped by small holders is 7,000.

12. The acreage of plantation cane is approximately 750 acres less than the previous year and 4,875 acres less than in 1941. The decrease is accounted for by the compulsory replacement under Defence Regulations of this acreage by food crops. A comparison of plant cane and ratoon figures with 1943 shows that there was a decrease of approximately 1,200 acres of plant canes and 400 acres of third ratoons reaped this year and an increase of approximately 550 acres each of first and second ratoons.

13. The percentages of the total acreage under the various varieties reaped in 1944 are as follows:—

	B.37161	B.35187	B.3439	B.H. 10(12)	B.726	B.2935	B.34104	B.3013	B.35245	Other and mixed Varieties
Percentages	48.69	11.28	9.49	8.00	4.79	4.73	4.19	2.98	2.06	3.79

Varieties. The new seedling varieties, B.37161, B.35187, B.3439 and B.34104 occupied 73.65% of the acreage reaped by plantations.

14. The yields of all varieties this year were much below those for the 1943 crop. This decrease was partly due to the irregular distribution of rain during certain periods of the growing season, but chiefly due to the late application of Sulphate of Ammonia, and, in many cases, to the absence of any application. The above factors greatly hindered the production and development of late tillers. The variety B. 37161 was more severely affected than the majority of the varieties grown as this seedling produces a very large number of late tillers which make up an appreciable percentage of its tonnage.

Breeding. During the 1943 season 112 crosses were made, and seedlings were obtained from 105. In all, it was estimated that 146,000 seedlings germinated, 32,744 of these were potted, and 32,398 survived the transplanting. Several crosses were made with recently imported breeding material, particularly of the species *Saccharum robustum* and its early derivatives. The policy of increasing the variability in the seedling material by interspecific crossing in the genus *Saccharum* is being continued.

Sugar Cane Seedling Trials. The Select Seedling Trials reaped during the 1944 crop indicated that of the B.40′ Series, two seedlings B.4098 and B.40105 showed some promise of becoming commercial canes under Barbados conditions.

15. Of the B.41′ Series B. 41211 and B.41227 showed promise under small scale trials as ratoons.

Mosaic Disease Resistance Tests. No new seedlings were planted in the trial at the Mental Hospital during the year under review. Of the 167 remaining from the previous year, 4 new seedlings and 7 check stools of the variety B.2935 showed mosaic disease symptoms.

16. Experiments with artificial inoculation using the Sein Method were started during the year 1943. Tests on 50 healthy Ba.11569 plants using B.2935 and B. 34104 infective material gave 100% infection in 14 days, and it was accordingly considered that the technique was satisfactory, but subsequent results did not bear this out. Fifty seedlings were taken from the progeny of each of 21 crosses and these were planted out at Queen's Park. The seedlings were all inoculated with the same infective material as above.. The results obtained appeared to indicate that all was not well with the technique employed, as the percentage number of infections was remarkably low in all cases. An attempt was also made to separate out different virus strains, using 8 different varieties as indicator plants. Here again it was found that the technique employed was faulty, as infected B.37161 material produced no infection on healthy B.37161 plants. Experiments have accordingly been planned to try to improve the technique.

17. The selections from B.41′ Series were artificially inoculated with B.2935 and B.34104 infective material from the sources mentioned above, and 7 of the 22 seedlings took the disease, the remainder being apparently immune, at least to the strain or strains of the virus used.

3. INSECT PEST CONTROL.

Sugar Cane. A total of 142,425,600 egg parasites *Tricogramma minutum* was bred up during the year under review, for the control of *Diatraea saccharalis* in sugar cane; the total number available for liberation was 126,533,000.

18. Moth borer infestation was reduced to an average of 11.1 per cent internodes infested, the majority of samples being taken from the new varieties B.37161, B.34104 and B.3439.

19. Random samples of canes were taken at eight factory yards instead of at twelve, owing to transportation difficulties.

20. A survey was made in June and July, 1943 to recover any of the introduced parasites *M. minense, Lixophaga* and *Paratheresia.* This search covered an island wide area from which 7,580 dead hearts were taken and dissected but none of the above named parasites was found. The mass reared egg parasite *T. Minutum* still constitutes the mainstay of control over *D. saccharalis* despite repeated introductions of other known parasites of this pest. The effectiveness of *Trichogramma* in Barbados is due to weekly, island wide distribution of freshly reared parasites during the six months of major cane growth; the total cost of such operations works out at about twelve cents per acre per year.

21. Investigational work on the relation between rind hardness incidence of *D. saccharalis* attack and extent of *D. saccharalis* egg deposition on different cane varieties was continued.

22. Damage to sugar cane by the beetles *Diaprepes abbreviatus* and *Lachnosterna smithi* is now only partially controlled by hand collection of the beetles. The number of *D. abbreviatus* (root borer) reported collected this year was 271,760 and of *L. smithi* (brown hard back) 268,660, but the beetles were not as universally collected as in former years, and the number recorded cannot be taken as an indication of the extent of control over these pests. General evidence during the year points to an increase in the numbers of, and of damage to cane caused by these pests.

23. The introduced predator *Pyrophorus luminosus* (firefly) can still be found in the hillier regions.

Food Crops. The army worm (*Laphygma eridania*) was again the chief pest of sweet potatoes; many fields were defoliated by this pest. The effect of defoliation on sweet potato yields was determined during 1943-44 by artificially defoliating randomised plots of sweet potatoes at different growth stages in blocks of uniformly growing potatoes. The defoliation was similar to that caused by "army worm" and in all cases the defoliated plots regained their foilage. The results on yields obtained were striking. Two defoliations, one at six weeks and the other at ten weeks after planting, caused a loss of 87.3% of the crop, as shown by the yields of the randomised control plots. One defoliation at eight weeks after planting caused a loss of 63.7% of the crop, and one defoliation at twelve weeks after planting and just one week before reaping caused a loss of 6.5% of the crop. These results show decisively the preventable loss in food due to defoliator attacks. The experiment will be repeated.

24. The control of scarabee in sweet potato was again confined by randomised block spraying during the year under review. There was an insufficient amount of spray apparatus and material available during the spring crop season, which hampered field control of insect pests, but the position with regard to apparatus, etc., has since improved. Thrips (*Dendrothripoides ipomaea*) and the leaf hopper (*Empoasca solana*) damage was generally slight.

Cassava. Moderate damage was caused to this crop chiefly by thrips, leaf hoppers and red spiders, but, on the whole, cassava fields were not as severely attacked during the year under review as in the previous year.

Corn. The attacks made on this crop by *Laphygma frugiperda, Heliothis obsoleta* and *Diatraea saccharalis* were frequently of only slight intensity.

Cotton. The cotton worm *Alabama argillacea* caused severe damage to cotton fields and consequently loss of crop in some areas; this was due in most cases to the scarcity of spray apparatus and material.

25. No Pink boll worm (*Platyedra gossypiella*) was found, and the limitation to profitable cotton growing in Barbados is at present primarily the damage caused by the defoliator *A. argillacea.*

Cottony Cushion Scale. Very slight outbreaks of this pest were found in scattered areas and, in nearly all cases, the predator *Rodolia cardinalis,* which was introduced early in 1943, was seen controlling the scale.

4. COTTON

26. The acreage under cotton for this season was 905 acres as against 648 acres in the previous season. The total yield of seed cotton was 227,188 lb., made up of 44,443 lb. from 195 acres of plantation cotton and 182,745 lb. from 710 acres of peasants' cotton. The average yield per acre for plantation and peasants' cotton was 228 lb. and 257 lb. respectively. The average yield per acre for all plantings was 251 lb. The ginning percentage for the Island's crop as recorded by the Barbados Co-Operative Cotton Factory was 27.1.

27. *Progeny Row Selections.* Work was continued during the season with selfed seed obtained from thirteen plants selected from the progeny plots during the 1942-43 season and the standard variety B.1.

28. The selfed seed of the bulked cotton from the thirteen selections of the 1942-43 progeny plots was grown at Codrington Experiment Station in a variety trial with B.1. as a standard. Seven of these have been selected on yield of seed cotton per acre and ginning out-turn and will be grown in a further variety trial next season; they are B.4203, B.4204, B.4205, B.4206, B.4209, B.4211 and B.4212.

29. A second variety trial was conducted at Codrington Experiment Station during the season which included selections of the "B.38", "B.40" and "B.41" series with the standards B.1. and two strains selected in St. Vincent by the Cotton Station from seed of a Barbados strain sent there for progeny work; these have been numbered B.(41)5 and B.(41)9. Three of the varieties in the trial have been retained, viz: B.4106, B.4111 and B.(41)9 and will be included in a variety trial, next season with the selection of the "B42" series and the standard B.1.

30. Samples of lint of the thirteen strains B.4201 to B.4213 and of the varieties B.4101, B.4103, B.4105, B.4106, B.4107, B.4111, B.(41)5, B.(41)9 and B.1. were sent to the Shirley Institute for small scale spinning tests.

Cotton Pests. The principal pests of cotton in Barbados are the pink boll-worm (*Platyedra gossypiella*) and the leaf defoliator (*Alabama argillacea*). For the fifth year in succession no pink boll-worm has been found in the cotton crop, but there were several heavy attacks of the defoliator (*Alabama argil-*

lacea), which severely damaged fields of both plantation and peasants' cotton and have greatly reduced the yields. These attacks could not be adequately kept in check as it was impossible to obtain the necessary insecticides at an early date due to lack of shipping facilities.

5. MINOR CROPS.

31. *Fruit Trees.* The propagation and distribution of economic fruit trees was continued during the year under review. 839 trees were distributed and 15 young mango trees were top worked. The distributed trees comprised chiefly in order:—budded limes, orange, grapefruit, avocado pear, mandarin, shaddock, pomelo and lemon, with smaller numbers of rooted breadfruit root cuttings, seedling Barbados cherry and rooted cuttings of fig, grape and golden apple.

32. *Miscellaneous Economic Plants.* 3,614 dwarf coconuts imported from St. Lucia were germinated and distributed. Other planting material distributed comprised:—Guatemala grass cuttings, sweet potato cuttings, banana suckers, eschalot bulbs and pumpkin cuttings.

33. *Garden Vegetables.* The following importations were tested against the standard varieties in small scale trials:—

(1) *Stringless Beans—Bush.* Varieties.—Masterpiece, Asgrow Black Valentine, Kerneys' Stringless Refugee, Pencil Pod Black Wax and Burpees Stringless Green Pod from Canada.

(2) *Stringless Beans—Climbing.* Varieties.—Blue Lake, Epicure and Sinebone from Canada, St. Lucia and British Guiana respectively.

(3) *Lima Beans—Bush.* Varieties.—Henderson's Bush from Canada and Six Weeks from Antigua.

(4) *Cabbage.* Variety.—Penn State Ball Head from Canada.

(5) *Lettuce.* Variety.—New York No. 12 from Canada.

(6) *Beet.* Variety.—Detroit Dark Red from Canada.

(7) *Radish.* Variety.—Scarlet Turnip White Tip from Canada.

(8) *Carrot.* Variety.—Nantes, Chantenay and Red Cored Chantenay from Canada.

34. *Vegetative Propagation of Pawpaw.* Experiments were carried out on the vegetative propagation of pawpaw trees by the removal of rooted side shoots and marcottage.

Fodder Crops.

35. (1) *Soya Beans.....*The fodder variety Giant Speckled was imported from British Guiana and tested. It did not prove to be suited to local conditions and has been discarded.

36. (2) *Perrennial Kavirondo Sorghum.* Seed of this fodder Sorghum was obtained through the Inspector General of Agriculture and tested against the local Guinea Corn and Imphee. Owing to poor stands the results of the trial were unreliable. The seed has now been multiplied up further and another trial will be planted.

37. (3) *Fodder Cane and Grass Experiment.* Included in this experiment, which was planted in 1941, were the two fodder canes B.34104 and B.37193

and Elephant and Guatemala Grass. Three cutting rotations at 180, 90 and 45 days intervals were employed. The experiment has been concluded and the results will be published elsewhere.

38. (4) *Irrigation Experiment.* This experiment was planted in 1941 and was planned to yield data on the amount of irrigation water necessary to optimum yields from the fodder cane B.34104. Owing to the slope of the experimental area no reliable data were obtained and the experiment was abandoned.

PASTURE GRASSES AND LEGUMES.

39. (1) *Trials.* Yields were obtained from the two trials at Seawell and Gun Hill in which four strains of *Cenchrus ciliaris* were being compared with the local sour grass *(Andropōgon pertusus).* None of the imported strains compared favourably with sour grass and their establishment is very much more difficult. The trials have been discontinued.

40. (2) *Collection of local grasses and legumes.* Small museum plots of 32 local grasses and 30 legumes have been established at Codrington. During the year under review studies were made on their growth and the herbage produced chemically analysed.

PIGEON PEAS AND LEUCAENA GLAUCA IN SOUR GRASS PASTURES.

41. Pigeon Pea and *Leucaena glauca* provide seed and foliage of a high protein content. Both plants have been established in the sour grass pasture at Gun Hill and in the case of *Leucaena glauca* in the pasture at Seawell also. The growth of both plants has been indifferent and the experiments are not being continued.

42. *Indian Corn.* Selection by replicated ear to row trials was continued at Codrington but little or no improvement in yield has resulted. In future the work will be confined to mass selection in plantation fields and the subsequent distribution of the selected seed.

43. *Pigeon Peas.* The selection for yield in early and late bearing types was continued. Again this year all of the early bearing trees were flowering in May—June but owing to severe leaf hopper attack the yields were negligible.

6. WARTIME FOOD PRODUCTION.

44. *Food Crops.* As in previous war years, the acreage of food crops grown was regulated by Notices served under the local Food Production (Defence) Control Order, 1942, No. 2. During 1943-1944 all owners were compelled to plant, under the usual conditions, the same acreage as during the previous year, viz :—a minimum of thirty five per cent of their arable acreage of which at least twelve per cent (of the total) had to be thrown-out land. Some changes were made in the acreages of crops in view of the glut of potatoes from preparation land during 1942-43. In preparation land the acreage of maize was considerably increased while that of potatoes was reduced and more tomatoes were grown. In thrown out land the acreage of potatoes was increased while that of cassava was reduced. Also, a much greater choice of crops was allowed and as a result, the area in maize was five times as great and that in bananas three times as great as during 1942-43.

45. Conditions were not so favourable for food crops as in the previous season. Rainfall was not so well distributed. Most planters complained of a shortage of agricultural labour especially during May—August, 1943 which delayed the preparation of the land and planting of food crops. This in turn caused a much reduced yield of yams and early potatoes.

46. The Government Factory at Lancaster was completed in May, 1943 and worked until November. It processed about half of the large cassava crop planted in 1942. Cassava flour for human consumption and meal for livestock were produced.

47. *Local Meat Production.* Under Defence Regulations, strictures continued to be placed on the slaughter of breeding and young stock. All owners of plantations were required to keep a certain prescribed minimum of livestock of specified kinds. The number of cattle slaughtered continues at the pre-war level while the number of sheep and goats has risen by fifty per cent. There has been a sharp decline in the number of pigs available for slaughter. This is largely due to the fact that oilmeal is in very short supply, very little being available for the feeding of pigs.

7. AFFORESTATION SCHEME.

48. The free distribution of young casuarina trees was continued and a total of 10,712 trees was distributed during the period under review.

49. At Needham's Point 605 Casuarina trees were planted.

8. SOIL EROSION

Treatment of Semi-denuded Sour Grass Pasture on a Steep Slope.

50. Through the courtesy of Mr. J. Haynes, a sour grass pasture on a steep slope at Parks Plantation was made available for treatment against erosion, and to test the effect of various trees on the growth of the grass.

51. The field was surveyed, 72 plots were laid out, each plot being 100 feet square. It was proposed to plant 18 species of trees in replicate, alternate plots being left as controls.

52. Holes, 2½ feet square and two feet deep, were made on one half of each plot, beds 18″ square being made on the other half.

53. All plots were planted on September 22nd, except one plot of Cordia, and the two plots of Saman, seedlings of the former and seed of the latter not being available at the time.

54. Photographs of the area were taken before planting, and these will be repeated at yearly intervals for purposes of comparison.

55. The weather after planting was favourable, and a good take was obtained. However, cattle were allowed to graze on the hillside and many of the trees have been damaged. Landslides during heavy rains in October and November accounted for the loss of five seedlings, 3 from plot 2 and 2 from plot 10.

Treatment of Denuded Hillside by Natural Regeneration.

56. A site of approximately the same size and under the same ecological conditions as that previously treated at Haggatts was selected to the south of the latter.

57. As a number of peasant holdings were at that time situated on the site, it was decided that nothing further should be done until after the crop when the peasants would be removed.

Co-operative Contour Drainage. During the period under review, the drains laid down on three fields on Bath Plantation and one field at Byde Mill in 1942 were inspected regularly, and cleaned when necessary. Khus khus grass was planted along the upper edges of some of the drains at Bath and has proved to be very effective in stopping soil wash. One field at Bath which was under sugar cane gave a yield of 32 tons to the acre, which we are informed is the best crop taken off that particular field for a number of years. The field at Byde Mill also gave a yield of 32 tons per acre, which is a record yield for that field.

9. PEASANT AGRICULTURE.

58. *Educational and Advisory.* Lectures and demonstrations were given at elementary schools, in peasants' holdings and in the vegetable garden at Codrington Experiment Station. The subjects dealt with included mixed farming, animal husbandry and breeding, top working of mango trees, the growing of cotton, ground nuts and green vegetables, and recommendations as to the varieties of sugar cane for planting.

59. The distribution was continued of literature on the care and rearing of crops and certain kinds of livestock.

60. Advice and assistance were given to peasants so that they might obtain fertilizer which was in short supply.

61. *General.* Prizes for the best kept vegetable gardens were awarded at the Annual Industrial Exhibition. There was a class for peasants and one for elementary schools. Competition was keen as 71 peasants and 67 schools competed.

62. Money was provided from the Colonial Development and Welfare Fund to meet the cost of seven small farms for the keeping of stud animals and the demonstration of mixed farming. It is expected that these farms will be of considerable assistance to peasant agriculture. During March, 1944, "The Home" in St. Philip and "Sayer's Court" in Christ Church were purchased. A search for other suitable properties continues.

63. The Peasant Agricultural Instructor staff was quadrupled during February and March, 1944. With the additional men, it was possible to speed up the peasant survey which should be completed within the next few months.

64. *Peasants' Loan Bank.* As a result of the extension of the scope of the original Act by providing facilities for the payment of mortgages and purchase of livestock, loans advanced to peasants have increased from £2,253. 10. last year to £3,508. 15. this year. The number of borrowers showed an increase from 396 to 518 persons.

65. Of the total loans made, the sum of £2,585 was advanced to 422 persons for cultivation expenses against 664 acres of land of which 317 acres were in canes and 347 acres in cotton and food crops.

66. During the year under review, beside the sum of £800 entrusted to the Bank for administration in connection with the rehabilitation of the Fishing Industry, a further sum of £2,250 was made available for the construction of 15 new fishing boats and repairs to the existing fleet.

67. With the recent appointment of a Fisheries Officer this service has been taken over by this Officer.

10. CHEMICAL INVESTIGATIONS.

Sweet Potato Manurial Trial.

68. This experiment has been continued on the same site at Codrington since June, 1941, the treatments being:—

(1) Control—No Manure.

(2) N_1K_1 —2 cwt. Sulphate of Ammonia and $\frac{3}{4}$ cwt. Muriate of Potash per acre.

(3) N_1K_2 —2 cwt. Sulphate of Ammonia and $1\frac{1}{2}$ cwt. Muriate of Potash per acre.

(4) N_1K_3 —2 cwt. Sulphate of Ammonia and 3 cwt. Muriate of Potash per acre.

(5) K_1 —$\frac{3}{4}$ cwt. Muriate of Potash per acre.

(6) K_2 —$1\frac{1}{2}$ cwt. Muriate of Potash per acre.

(7) K_3 —3 cwt. Muriate of Potash per acre.

69. The results of the fifth and sixth reapings, which took place during the period under review, indicate that while no particular manurial treatment caused an outstanding increase in yield, exhaustion of the control plots has occurred.

Yam Manurial Trial.

70. A yam manurial trial was reaped for the first time in February, 1944. The lay-out and rates of applications of the fertilisers were the same as in the sweet potato trial. Yields were erratic and no conclusions can be drawn from them. One half of each plot was mulched but the yields from these half plots were not greater than those not mulched. The indication was the mulching might even depress the yield.

Cassava Manurial Trials.

71. Trials were laid out in September, 1943, at four estates—Claybury, Frere Pilgrim, Lemon Arbor and Buttals—representative of the various rainfall types. The experiments take the form of 4 x 4 Latin squares, the treatment being:—

(1) Control

(2) N_1K_1 —1 cwt. Sulphate of Ammonia and $\frac{1}{2}$ cwt. Muriate of Potash per acre.

(3) N_2K_2 —2 cwt. Sulphate of Ammonia and 1 cwt. Muriate of Potash per acre.

(4) K_2 —1 cwt. Muriate of Potash per acre.

Food Yeast.

72. Cultures of the Food Yeast *Torulopsis utilis* var. *major* have been received. By propagating this yeast in molasses containing ammonium phosphate, it is hoped to produce a protein and vitamin rich food. To this end a pilot plant has been erected and successful trial runs made.

Cassava Flour.

73. The plant for which the Legislature voted £15,000 was constructed during the year using all locally obtained or built equipment. It was officially opened in June. After a great deal of experimentation during June-October, the plant settled down to a production of 12—14 tons daily of meal or flour.

74. A total of approximately 800 tons of Cassava Meal and Flour was produced. This was used to implement the local flour and feeding-stuffs supplies.

Molasses and Megass Fuel.

75. Experiments in collaboration with Mr. H. C. Watson, on the production of a charcoal from megass and molasses were continued. A pilot demonstration plant was erected and trial runs made; many mechanical difficulties were encountered which further experiments are endeavouring to solve.

76. In the meantime, to meet local fuel demands, a substitute for wood has been developed. This fuel, known as "Charmol", is simply a mixture of megass char and molasses—and burns quite efficiently and satisfactorily particularly in baking ovens.

Quicklime.

77. Due to scarcity of fuel and import restriction, the supply of quicklime for cane juice clarification in Sugar Factories became critical.

78. An experimental kiln was constructed at Turner's Hall—where natural gas is available to investigate the production of quicklime using this fuel. Experiments were very successful and as a result a full size kiln, burning natural gas, was rushed to completion at Apes Hill. This kiln is functioning very satisfactorily and producing a high quality lime at a rate of 5—6 tons daily.

79. The total number of samples analysed during the year for the various Government Departments and for private individuals was 1,029 and the number and distribution of samples for the past three years may be summarised as follows:—

	1941	1942	1943
1. Police Department	447	416	412
2. Customs Department	44	53	46
3. Water Works Department	51	23	12
4. Agricultural Department	107	12	110
5. Sanitary and Parochial	134	145	265
6. Agricultural Society	118	116	33
7. Other Government Departments	34	24	39
8. Private	148	153	112
Total	1,083	942	1,029

11. PLANT DISEASES INSPECTION.

80. One hundred and fifty two (152) separate consignments of imported planting material were examined on arrival and admitted. Seven (7) Coconut plants were destroyed. Two hundred and twenty two (222) Bales of Cotton Lint which were intransit were examined and no pests of cotton were found. The holds of six (6) ships bringing cotton seed were fumigated with "Zyklon B" and 2,839 bags of imported cotton seed were disinfected by means of the Simon's Heater. Three shipments of Cotton seed meal from Haiti were examined for the presence of the Mexican Boll-weevil and none found. During the present year search was made for the pink bollworm of cotton and up to the time of writing none has been found.

12. AGRICULTURAL LEGISLATION.

81. 1. 8th June, 1943. An Act to authorise the sugar Industry Agricultural Bank to make loans for carrying on the management of sugar factories in this Island and to consolidate and amend the Sugar Industry Agricultural Bank Act and amending acts.

82. 2. 7th July, 1943. Department of Science and Agriculture (Amendment) Act, 1943 increasing the amount of money provided for the passages of scientific officers on first appointment from £100 to £200.

83. 3. 27th August, 1943. Love Vine Eradication Act, 1943. This Act places the onus of destroying love vine on the owner or occupier of land and in cases where there is no occupier and the owner is absent from the Island and has no recognised agent therein, it empowers any inspector to enter on any such land and to take steps as may be necessary for the effectual destruction of any love vine found thereon and also empowers the Governor-in-Executive Committee to direct the Colonial Treasurer to pay any expenses incurred by the Inspector in so doing, out of the Colonial Treasury.

84. 4. 13th September, 1943. Sugar Cane Mosaic Disease (Eradication) Act, 1943. This Act consolidates and amends the acts relating to the eradication of the Sugar Cane Mosaic Disease and places the onus of eradication on the planter. It also permits Government to enforce the planting in proclaimed infected areas of varieties of cane resistant to mosaic disease.

85. 5. 7th October, 1943. Department of Science and Agriculture (Amendment) Act, 1943, No. 2. This Act makes provision for the appointment of nine additional Peasants' Agricultural Instructors.

86. 6. 10th November, 1943. Food and Drugs (Adulteration) (Amendment) Act, 1943. This Act enables sampling officers to examine milk cans or other receptacles in possession of milk vendors and take a sample or samples of milk from any such can or other receptacles in which milk is found.

S. J. SAINT,
Director of Agriculture.